1 JULY 1957

data

OVERNMENT RESEARCH AND DEVELOPMENT DIGEST VOL. 2, NO. 7

BIC
UNIVER
ARTC HIO

In this issue . . .

NEW INSTRUCTION ON OVERTIME CUT

data

Data Publications
Dupont Circle Building
1346 Connecticut Avenue, N.W.
Washington 6, D.C.

Phone HUdson 3-9450

STAFF:

Editor – Murray Q. Smith
Associate Editor – Bernard Katz
Art Editor – Vera R. Cole
Features – Martin Caidin
Publisher – J. S. Smith

MILITARY CONSULTANTS:

Brig. General James J. Keating, USMC(Ret)
Colonel Joseph H. Kusner, USAFR

MID-WEST REPRESENTATION:

Joseph S. Smith
Queensmith Publishing Company
4 South Genesee Street
Waukegan, Illinois
Phone - Ontario 2-7398

WEST COAST REPRESENTATION

Justin Hannon
635 S. Kenmore
Los Angeles 5, California
Phone AXminister 2-9501

DATA provides a rapid information link between industry and government. It is designed to give readers a quick scan of the latest developments in the military services and government agencies on a wide range of topics. Additional information on DATA articles, when available will be furnished on request to subscribers. Unless otherwise notified within the article, send your request for further information to DATA, Dupont Circle Building, 1346 Connecticut Avenue, N.W., Washington 6, D.C.

All material in this or any issue may be reproduced without request. Please credit DATA.

SUBSCRIPTION RATES:

U.S. – $12.00 for 1 year; $22.00 for 2 years.
Foreign – $15.00 for 1 year; $28.00 for 2 years.
Checks may be made payable to DATA.

Second-class mailing privileges applied for and pending at Arlington, Virginia.

Title registered United States Patent Office.

Contents

July 1957 Vol. 2, No. 7.

DATA BRIEFINGS 7-3
New DOD Instruction on Overtime
Weapons Group and ARDC Changes
Seat-of-Pants Flying
Dissatisfaction with RASCAL
OPERATIONAL REQUIREMENTS 7-4
DOD INSTRUCTION 4105.48 7-5
MESSAGE TO READERS 7-10
Dr. Hyatt Tells of Tissue Bank
AIR & SPACE 7-12
Wind Tunnel Nozzle by Electroforming 309
Excerpts from Power's Space Speech 310
Chance Vought Developing New Fighter 311
Air Force Secretary Warns of Cutbacks 312
First Safe Underwater Ejection 313
COMMUNICATIONS 7-16
Automatic Navigator (APN-67) 314
Tiny Battery Developed 315
Giant ARDC Telescope for Tracking 316
ELECTRONICS 7-17
BuShips Announces New Production Concept 317
Automatic Device at ARDC Tests Parts 318
Forward Scatter Radio for U.S.-Europe 319
CONSTRUCTION 7-18
Caracas Building "Helicoid" 320
New Computing Center 321
ENERGY 7-19
Sunlight May Power Satellite Instruments 322
Power Stream Under the Sea 323
Small Business and Atomic Energy 324
LOGISTICS 7-20
In-Flight Pilot Refueling 325
ARDC Gets New LOX Plant 326
Self-Service Laboratory Store 327
MATERIALS 7-21
Titanium Reports Through Commerce 328
Solar Furnace from Army Searchlight 329
High Altitude Suit for Navy Pilots 330
ORDNANCE 7-22
CBR Gas Mask Developed by Army 331
Missile Test Range to be Extended 332
First Vanguard Vehicle Delivered 333
SHIPS 7-23
RANGER Commissioning Set for 10 Aug. 334
Cathodic Protection of Ship Hulls 335
Navy Lets Contracts on Small Ships 336
Canada Experimenting with Hydrofoils 337
MAGAZINE PREVIEWS 7-24
Missiles & Rockets
Signal
Air Force
U. S. News & World Report
DEADLINE DATA 7-25
Avionics — Mid-Air Collision Control
Electronics — Traveling Wave Accelerator
Logistics — Loading of Vehicles
Roads — SecDef Wilson
Training — Cold Weather Units

NEW DOD INSTRUCTION REINFORCES OVERTIME CUT:

Defense Instruction 4105.48 of 19 June adds strength to earlier SecDef Memo of 1 March which ordered overtime work cut. The new five-page edict signed by Perkins McGuire (reproduced in full in this issue of DATA) not only dispels any thought of removing the earlier request, but, in fact, outlines clearly what steps contractors must follow to insure compliance with the new instruction, even to written records.

WEAPONS GROUP AND ARDC TO GET NEW COMMANDERS:

SecDef Wilson has designated R/Adm. John H. Sides to be director of the Weapons System Evaluation Group, while present group director, Lt. Gen. Samuel E. Anderson will head Air Research and Development Command in Baltimore. R/Adm. Sides, former skipper of the Navy's first guided missile cruiser division, will step up to vice admiral in his new post, presently is assistant for missiles to Mr. Wilson. Another move, this one a physical relocation, is expected soon with ARDC headquarters going to Andrews AFB in Washington.

FAMED AERO-SCIENTIST COMES TO PAINLESS END:

That familiar feeling of "flying by the seat of your pants" may not be all in your mind, according to an experiment conducted by aeromedical specialist Dr. H. Strughold. In the interest of science, he injected a large dose of novacaine into his posterior, climbed into an airplane and took off. While performing acrobatics, Dr. Strughold, with true scientific objectivity, reported that absence of nerve impulses from his seat created in him feelings of fear, sickness and disorientation. Strughold's conclusion: A sensitive seat is the foundation of good flying.

DISSATISFACTION WITH RASCAL, BULL PUP GAINING FAVOR:

According to Appropriation Hearings, the Air Force is not satisfied with their only large air-to-surface missile, the RASCAL by Bell. Gaining favor is the Navy's air-to-surface weapon, the BULL PUP by Martin. Several sources indicate that Air Force may get fraternal and share BULL PUP with Navy. BULL PUP is reported to be relatively inexpensive, reliable and extremely effective.

OPERATIONAL REQUIREMENTS

AIRCRAFT:

The Army has a strong need for a higher performance aircraft for shallow penetration flights over enemy-held areas to obtain information and to acquire targets for our own surface-to-surface missiles. One of its primary functions will be to carry electronics surveillance equipment, such as infra-red and radar, that the Army will use for gathering intelligence information and target acquisition data.

///Maj. Gen. Hamilton H. Howze, Dir., Army Aviation/

Wheels-up landings continue to receive attention but no solution as yet. Suitable warning devices needed. Better not associated with closing throttle but perhaps could be combined with airspeed indicator where pilot's eye will be cast during final.

///Cdr. R. A. Weatherup, Operations Officer, USS BOXER/

Rotor hub parasite drag becomes more serious as machines are made aerodynamically cleaner (such as through retraction of landing gear) and means for reducing drag of hubs is needed by military, perhaps something analogous to radial engine cowling.

///National Inventors Council/

ELECTRONICS:

The submarine menace is still our foremost threat. We need a better sonar that would have increased range and less dependence on the human ear for discrimination of target. Also, we need a better way of locating enemy mines than is now available to us.

///Capt. W. E. Sweeney, Dir. of Avionics, BuAer/

MATERIALS:

Goals for improving canopy plastics have always been the same, i. e. more visibility and strength and better resistance to crazing. The need for improvement continues. Stress and harmful cleaning solvents are the two chief causes of crazing. Weathering is a less important factor. With pressurized jets climbing ever higher and faster, tiny creeping cracks can cause real trouble. Some fighter canopies have failed at high altitudes recently. Until better canopies are built, good maintenance is the answer. Services could use both better cockpit glass as well as perhaps a rejuvenating type cleaner.

///Naval Aviation Safety Center, Norfolk, Virginia/

NUMBER 4105.48
DATE June 19, 1957

ASD(S&L)

Department of Defense Instruction

Overtime Policy for Procurement Contracts

I. PURPOSE

The purpose of this Instruction is to effect an immediate, continuing and sharp curtailment in the use of overtime in the performance of all kinds and types of Department of Defense procurement contracts, including production, research and development, and construction. This Instruction amplifies the provisions of ASPR 12-102 with respect to the use of and payment for overtime.

II. RESCISSIONS

Memorandum addressed to the Materiel Secretaries by the Assistand Secretary of Defense (Supply and Logistics), dated May 16, 1957, Subject: Curtailment of Overtime, is hereby superseded and rescinded by this Instruction.

III. EFFECT UPON ASPR 12-102

To the extent that this Instruction differs from the provisions of ASPR 12-102 with respect to overtime, this Instruction shall govern.

IV. GENERAL POLICY

A. Department of Defense contracts shall be performed without the use of overtime, except as otherwise authorized in this Instruction. Before authorizing overtime premium pay, either in the negotiation of contracts or during the performance of contracts, consideration shall be given to using other sources to obtain required supplies or services. The use of overtime premium pay as a regular part of employee compensation is contrary to the principles of this Instruction. This policy is applicable to all contracts entered into after the effective date of this Instruction.

B. Unless a determination has been made pursuant to paragraph V below, the cost of performance of overtime shall not be considered in the negotiation, repricing, or administration of negotiated contracts.

data

C. Unless a determination as specified in paragraph V(i) or (ii) is made, no solicitation for bids or proposals shall require a delivery schedule which may be reasonably anticipated to necessitate overtime.

V. EXCEPTIONS TO GENERAL POLICY

Overtime premium pay may be authorized at Government expense only when the Secretary or his designee determines in writing that overtime--

(i) is necessary to meet delivery or performance schedules, and such schedules are determined to be extended to the maximum consistent with essential military objectives; or,

(ii) will result in over-all lower cost to the Government and such cost advantage is obtained by the Government; or,

(iii) is necessary--

(A) to eliminate specific production bottlenecks which cannot be eliminated in any other way;

(B) to cope with emergencies resulting from accidents, or natural disasters;

(C) to make up for delays beyond the control and without the fault or negligence of the contractor;

(D) to perform tests, industrial processes, and laboratory procedures which are continuous in nature and cannot reasonably be interrupted or otherwise completed.

The foregoing determinations shall be furnished to the contractor before performance of overtime work, except that in connection with (iii)(B) above the determination may be made and furnished as soon as possible after commencement of the work.

VI. APPROVAL OF OVERTIME

A. When determinations are made pursuant to paragraph V above, an authorization to perform overtime shall be included in all contracts other than firm-fixed price type either at the time of execution, by amendment, or by written notice to the contractor, as may be appropriate.

B. Determinations made pursuant to paragraph V(iii) above shall be supported by written request of the contractor. The contractor's request shall specify the reasons why overtime is necessary, and shall indicate (i) the specific operations and personnel which will be affected, (ii) the estimated number of hours of overtime to be required for each operation and class of personnel, and (iii) the estimated period of contract performance during which overtime will be required.

C. Contract provisions or determinations approving overtime shall be limited strictly to the minimum required for the accomplishment of specific work, and shall specifically indicate (i) the operations and personnel affected; (ii) the location of the plant or other facility and the department or other subdivision thereof; (iii) the maximum number of hours of overtime authorized and (iv) the period of time during which the authorization shall be effective. Contract provisions and notices shall provide for review and alteration by the Government upon a unilateral basis. Authorizations shall be reviewed periodically after they have been in effect for a reasonable period of time not exceeding 60 days to insure that the reasons upon which the determinations were based continue to be valid. Contract provisions shall provide for equitable adjustment pursuant to the Changes clause in the event of reduction or discontinuance of overtime.

D. Authority to make determinations and approve the performance of overtime shall not be delegable except as follows:

1. Under paragraph V(i) above, to a designee of the Secretary occupying a position comparable to or higher than the Head of a Procuring Activity.

2. Under paragraph V(ii) and (iii) above, to a Head of a Procuring Activity with power of redelegation only when the approval authority is limited to not more than 2 percent of total anticipated labor-hours under a contract.

VII. DEPARTMENTAL COORDINATION

A. In the absence of evidence to the contrary, personnel within a military department authorized to approve performance of overtime may rely upon the representation of a contractor that such approval will not adversely affect the performance of other Department of Defense contracts.

B. Where it is known or indicated that two or more military contracting activities have current contracts at a single facility so scheduled that the authorization of overtime by one contracting activity may affect adversely the performance of contracts of another activity, each of the contracting activities shall concur in the proposed authorization. Where both contracting activities are within one military department the procedures for obtaining concurrence or resolving disagreements shall be prescribed by that department. Where contracting activities of two or more military departments are involved, contracting officers shall obtain from the contractor the name and address of other contracting officers involved, and each shall furnish to the other, on a current basis, the name and address of the individual authorized to approve overtime pursuant to paragraph V above. When such individuals propose to approve overtime, concurrence shall be obtained from their opposite numbers; in the event of disagreement, the matter shall be submitted to the respective Heads of Procuring Activities for resolution by the most expeditious means through established channels. Disagreements between Heads of Procuring Activities in connection with any of the determinations referred to in paragraph V above shall be submitted by the most expeditious means through established channels to the Materiel Secretaries, who may refer the matter to the Assistant Secretary of Defense (Supply and Logistics) for final decision.

VIII. ACTION WITH RESPECT TO EXISTING CONTRACTS

A. Existing Department of Defense contracts under which overtime work is authorized, or in which it is known that the contract price includes a factor for overtime, shall be reviewed without delay. To the extent that such overtime work does not fall within the exceptions set forth in paragraph V, above, and savings to the Government may be expected, the following action shall be taken:

1. Contractors shall be requested to reduce or eliminate payment of overtime wages to the maximum extent possible, and, where contractually appropriate, authorization for overtime shall be withdrawn.

2. Where appropriate, performance and delivery schedules shall be extended by (i) supplemental agreement, (ii) change order (if permitted by the contract), and authorizations for overtime or the contract price shall be adjusted accordingly.

Any savings resulting from curtailment of overtime shall be recaptured.

B. Reviews referred to in paragraph A above shall include consideration of major first-tier subcontracts, particularly those under prime contracts providing for price redetermination, escalation, incentives; or cost-reimbursement, time and material, and labor-hour type contracts.

C. In eliminating or reducing overtime previously authorized, consideration may be given to allowance of a reasonable period for resuming operations without overtime.

IX. EFFECTIVE DATE

This Instruction is effective upon receipt, and in any event not later than 30 days after the date of this Instruction.

X. IMPLEMENTING INSTRUCTIONS

The military departments shall disseminate the provisions of this Instruction as soon as possible after receipt, and shall furnish a copy of each implementing directive and instruction issued at all levels to this office within 30 days after the date of this Instruction. All implementing instructions shall be made effective upon receipt, and in any event not later than 30 days after the date of this Instruction.

XI. RECORDS

Records will be maintained sufficient to enable the military departments to provide this office, upon request by separate action, with information concerning the progress made in the objectives of this instruction.

Perkins McGuire

PERKINS McGUIRE
Assistant Secretary of Defense
(Supply and Logistics)

C73223

U. S. NAVAL MEDICAL SCHOOL
NATIONAL NAVAL MEDICAL CENTER
BETHESDA 14, MARYLAND

IN REPLY REFER TO

1 July 1957

Dear DATA Readers:

The current deification of speed as a method of transport of individuals takes a tremendous disability toll of our people; the mutilation of the individual by the new and more competent methods of warfare defies comprehension and yet, as of this moment, these are but a fraction of the total causes of death. People continue to die because a vital portion simply wears out or is critically diseased. To counteract the accumulative effects of wear and tear, medicine has expended years of developing the surgical aspects of replacement for worn out, diseased and injured anatomical parts.

Until recently we have inched forward, but in the last five years we can demonstrate that we have now taken a full forward step. Naval medicine has been privileged to have played a part in this progress largely because of its unceasing efforts to increase the efficiency and humanity of the treatment of our wounded. In this pursuit of superior treatment of the war wounded, we find that we share many problems with our civilian conferees. The part that we in the Navy have played in the progress of tissue replacement has been largely through the Tissue Bank at the National Naval Medical Center.

The Tissue Bank is a Division of the Naval Medical School and is a clinical research and development unit. It emphasizes the procurement of human tissue from cadavers and provides impetus for the development of new surgical uses of tissues on our patients. In its six years of existence, the Tissue Bank has performed over 180 sterile post-mortem excisions, stored over 5000 tissue deposits and withdrew enough tissue to treat over 1700 patients.

This unit had its humble beginning as a four-cubic-foot deep freeze for cold storage in 1949. It soon became evident that the need for adequate quality and quantity of human tissues could be filled only by going to the deceased in the name of tissue logistics. The vision of our seniors is exemplified by then Captain now Rear Admiral B. W. Hogan, MC, USN, the Surgeon General, who as Commanding Officer of the U. S. Naval Hospital, Bethesda, Md., significantly contributed to the success of the tissue procurement program.

MESSAGE TO READERS

Dr. Hogan developed administrative practices which enable the grieving family of the deceased to clearly understand the tremendous service to humanity that could be accomplished by release of the remains for tissue procurement.

The primary achievements of the Tissue Bank to date have been the development of sterile post-mortem tissue excision and the clinical development of the FREEZE-DRY process. Freeze-drying is a method of processing by drying the tissue while still frozen by subjecting the frozen tissue to a relatively high vacuum. The final product contains largely chemically bound water and so is stable enough to be stored at room temperatures. The quantities of grafts that may be procured without contravening social proprieties associated with the deceased and the development of tissue storage at room temperature has permitted us to send our tissues to over 170 military and civilian surgeons. A significant number of these are in foreign countries. The freeze-dry process has taken tissue storage from the status of a surgical curiosity and elevated it to the place of a limited, although definite, advance in medicine.

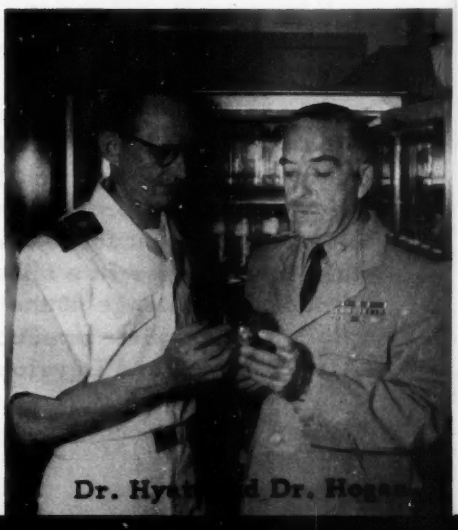
We can now, with reasonable clinical success, store bone, skin, fascia, dura (brain covering), cartilage and arteries.

The problems that still face us are those of defeating the "homograft" response, whereby adult living cells will not always survive when transplanted from person to person. If we could but consistently overcome this problem, the surgical science of replacement would parallel the boon that antibiotics development conferred on mankind. Millimeter progression is currently being made toward abolishing or paralyzing the "homograft" response. However, it must be confessed that we cannot even see the surgical horizons. Yet even a cursory survey of our problem gives us a glimpse of the tremendous potential for advancement of our physical future.

Sincerely,

George W. Hyatt

Dr. George W. Hyatt
Commander, MC, USN
Head, Tissue Bank
Natl. Naval Medical Center



Dr. Hyatt and Dr. Hogan

309. WIND TUNNEL NOZZLE DEVELOPED BY ELECTROFORMING:

A new wind tunnel nozzle has been constructed for aeroballistic research in the Mach 8 range by the Naval Ordnance Laboratory. It is called an axi-symmetric nozzle. It is new and different in design and is the first contoured, hypersonic nozzle ever built by a unique electroforming process. The all-nickel nozzle was electroformed on a stainless steel mandrel in about four months of almost continuous plating.

Electroforming is a type of electrodeposition whereby a layer of metal is gradually built up until it becomes a structural shell. The mandrel is passivated so that the coating does not adhere to it. Electroforming was selected after several methods, including metal spraying, spinning, and maching, were tried and proved unsuitable.

Rapid strides forward in aeroballistic research are expected to result from studies with the new wind tunnel nozzle. Production was a joint effort of the Aeroballistic Research Department and the Technical Shops Division of NOL. More information is available from the Technical Information Officer, Naval Ordnance Laboratory, 1-179 White Oak, Silver Spring, Md. ///NOL Report 06-1/

310. EXCERPTS FROM GEN. POWER'S SPEECH ON SPACE FLIGHT:

On 19 June, Lt. Gen. Thomas S. Power, Commander ARDC, gave a speech at the Summer Meeting of the Institute of Aeronautical Sciences in Los Angeles. Subject: Air Force R&D in Space Technology.

"The purpose of my talk tonight is to give you a brief review of some of the research and development efforts in those areas of space technology which are of direct concern to the Air Force.

"There are several compelling reasons for the Air Force's interest in space technology, the most important one being the fact that for all practical purposes, we are already operating in space, or more accurately, under conditions approaching those of space. Ninety-nine percent of the atmosphere lies below 20 miles. This altitude has already been exceeded by manned aircraft. Last year, Capt. Iven Kincheloe of ARDC flew the Bell X-2 rocket powered test vehicle to an altitude which I can now confirm to have reached 126,200 feet.

"If our efforts in military technology continue to maintain for us a truly deterrent force, the time is bound to come when man will venture ever deeper into space -- not to win wars on earth but to battle the limitless challenge of the universe."

///Complete speech on request: Office of Information Services, Air Research and Development Command, Box 1395, Baltimore, Md./

311. CHANCE VOUGHT DEVELOPING NEW NAVY FIGHTER:

The Navy disclosed that Chance Vought Aircraft is developing a new fighter designed for carrier launch and to operate at speeds more than twice that of sound.

Although no exterior views have as yet been released, the Navy, in their Department of Defense release of 19 June, stated the plane will have "...swept wing mounted high on the fuselage and well back of the cockpit section. A sharp, pointed nose containing radar gear fairs into the cockpit area with airscoop well forward under nose."

Powerplant will be the Pratt & Whitney 15,000-pound thrust J-75 with afterburner.

Chance Vought has received a $35 million development contract with fleet deliveries scheduled for 1960.

///Pentagon OPI press release 0619 free on request. DATA/

312. AIR FORCE SECRETARY WARNS OF CUTBACKS:

A shrinking market for aircraft manufacturers was the ominous news given out by Air Force Secretary James H. Douglas to representatives of the industry. At a Pentagon meeting for aircraft industry leaders held 20 June, Douglas dealt a face-up hand.

He flatly warned the plane builders that drastic measures were in store for them. He cited rising costs and the budget ceiling, explaining the Air Force would have to get better equipment at less cost.

Part of the problem stems from rising costs in the twin fields of missile development and aircraft modernization.

Some parts of the industry will suffer, Douglas said, as research and development projects will be cut.

///DATA Pentagon Coverage/

313. NAVY MAG REPORTS FIRST SAFE UNDERWATER EJECTION:

The June issue of Approach, Navy's aviation safety review, tells of the first successful underwater pilot ejection. Skidding over the side because of brake failure, the Douglas F4D-1 entered the water inverted. The cockpit canopy shattered on impact and the flooded plane sank fast. Pilot pulled face curtain, firing ejection seat. The helicopter rescue pilot reported from the ejection charge bubble until the pilot shot to the surface was 45 seconds. Pilot swears it was three weeks. ///Norfolk/

Electron

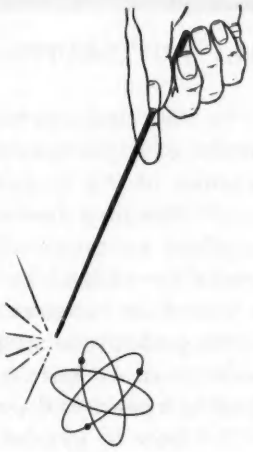
The deep-drawn one-piece molybdenum anode replaces the conventional welded anode.

1907 FANSTEEL 1957 • Golden Anniversary of Progress •

FANSTEEL

...AGIC

...depends on METALLURGY



And as the science of metallurgy advances so does the electronic tube.

Take this X-ray valve tube, for example. Moly for a long time was known as the ideal anode material, but it had to be formed and welded as a two-piece construction.

Now because the Fansteel metallurgist puts more ductility and more uniformity into the metal the anode is *deep drawn* with these benefits:

Fewer tube rejects
Easier assembly
Quicker and more thorough outgassing
180° flared edge
Wall and end thickness uniform
No grooves
No welds

Metallurgical *progress* in refractory metals is an established habit at Fansteel. Try us for difficult problems in molybdenum, tungsten, tantalum and high density metals.

The case history repeated here is typical of the news found in Fansteel Metallurgy, a free journal of information. Ask to be put on our mailing list—all we need is your name and business address.

...TALLURGICAL CORPORATION

NORTH CHICAGO, ILLINOIS, U. S. A.

314. AUTOMATIC NAVIGATOR (APN-67) DEVELOPED FOR NAVY:

An "automatic navigator" has been developed to meet requirements of high-speed, jet-powered flight, the Navy announced in a press release of the Department of Defense dated 19 June.

The new instrument provides continous navigational information to pilots automatically. Based on the air-ground radar Doppler system, it was developed by the Navy and the Ryan Aeronautical Company after 10 years of research. Doppler systems utilize airborne radar, transmitting electro-magnetic impulses to the earth's surface which bounce back to an airborne receiver, making it possible to determine the aircraft's speed and precise position over the ground.

Now in production, the 200-pound APN-67 unit has been tested in military patrol and attack aircraft, transports and high-speed jet aircraft. The new equipment has far-reaching importance for all types of aircraft, the Navy says.

///Pentagon OPI press release 0619 free on request. DATA/

315. TINY BATTERY DEVELOPED:

A dry battery which is practically indestructible and can be recharged for years on end is disclosed for the first time in the June Report of the Naval Ordnance Lab. Purpose of the new miniature battery is to power the small electronic circuits of the jet age.

Simple in construction and readily adapted to mass production, the new battery (XA-108) was built primarily to power recently developed electrochemical control units used in the "brains" of underwater mines. It is just as readily adaptable for use in transistor circuits of hearing aids, walkie talkies, air navigation systems and portable radios, according to inventors Monroe B. Goldberg and Herbert B. Reed of NOL.

///Write: Tech Info, NOL, 1-179 White Oak, Silver Spring, Md./

316. GIANT ARDC TELESCOPE DOES PRECISION WORK:

Mounted on a 90 mm gun mount, a giant TPR (Telescopic Photographic Recorder) has been developed for the Air Research and Development Command by the Perkin-Elmer Corporation of Norwalk, Conn. The TPR is capable of tracking and photographing a pop bottle sized object four miles away. Mechanism is currently under evaluation at Eglin AFB. ///Write: OIS, ARDC, Box 1395, Baltimore, Md. for additional/

317. BUSHIPS ANNOUNCES NEW PRODUCTION CONCEPT:

The Navy's Bureau of Ships, after three years of study and planning, is ready to launch formally an important new concept in the design and production of military electronic equipment.

Announcement of the new plan is made in the current June issue of the BuShips Journal.

Stated simply, the idea is to have manufacturers make a thorough value engineering study before starting production on an electronics contract and come back to the Bureau with concrete suggestions on how the equipment can be made more reliable and at less cost. In most cases, the Journal states, this would result in some change in basic design. If savings are involved, Bureau believes it can get Renegotiation Board to allow manufacturer to retain his share.

This is an important new concept and interested contractors are invited to request copies of the article at no charge. Write: Technical Information Office, Bureau of Ships, Rm. 3403 Main Navy, Washington 25, D. C. ///BuShips Journal 06-34/

318. AUTOMATIC DEVICE AT ARDC TESTS ELECTRONIC GEAR:

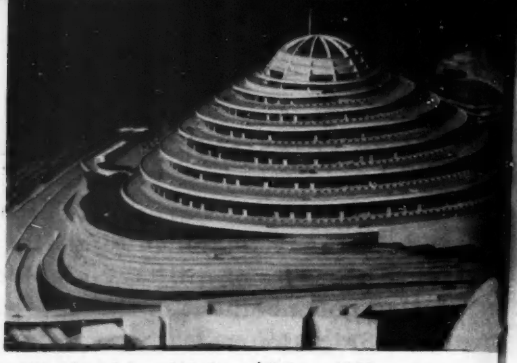
Experimental electronic components are being tested more rapidly and accurately with the Automatic Life Test and Data Recording Rack for Electron Tubes, Transistors, and Crystal Diodes. Developed for ARDC by Systems Development, Inc., of Binghamton, N. Y., tests lasting as long as 1000 hours can be conducted unattended with results automatically recorded by an electric typewriter. The machine can test 800 specimens now and special environmental chambers for heat, vibration, and altitude are being installed.

///Write: OIS, ARDC, Box 1395, Baltimore, Md. for additional/

319. FORWARD SCATTER RADIO WILL AID U.S. - EUROPE LINK:

Three "forward scatter" radio stations and a new Atlantic cable will be combined to provide a direct voice and four teletype communication channels between Europe and North America, according to a decision of the Council of the International Civil Aviation Organization this month. The new web will provide communication over air traffic routes now connected by telephone lines only. Additional information from L. C. Boussard, Public Information Officer, ICAO, Montreal. ///ICAO/

CONSTRUCTION



320. CARACAS BUSINESS CENTER called the "Helicoid" is being built on the top of a mountain overlooking capital city of Venezuela. The amazing spiral in space will be one of the largest self-contained business and commercial centers in the world in 1960 when it is completed. Cost of the Helicoid will be $25 million.

The Helicoid provides for 320 small stores, many industrial showrooms, a hotel, swimming pool, garages and business offices. In the dome there is a "Great Hall" for international trade fairs. Other features include a closed television circuit to show prospective buyers merchandise in the Helicoid sales rooms, a businessmen's club, a children's park, and among other novelties, seven theatres each continuously showing the same film at 20 minute intervals.

The structure is built for both the motorist and the pedestrian. A feature of the building is a spiral ramp with a hardly noticeable incline of 2.5%. You can drive right up to an office or store and park your car in front of it. For pedestrians there are inclined elevators, ramps and escalators.

The structure is designed to cover 25 acres and at its highest point will be 365 feet above the Caracas mountain it is designed to cap. It will be 10 stories high on one side and 25 stories high on the other. This irregularity is due to the fact that the building is contoured to the side of the mountain. The view down to Caracas will be breathtaking.

Helicoid is being financed and built by local Venezuelan firms. The three main share holders are the INACA Construction Co., IVECA Construction and the Inversiones Planificadas Investment Company.

///Venezuelan Information, 2437 California NW, Washington, D. C./

321. NEW COMPUTING CENTER FOR MISSILE ANALYSIS:

A self-contained, insulated area of 17,000 square feet holds the latest automatic processing and computation equipment for evaluating test data of missile weapon systems. Recently built by General Electric for their Missile and Ordnance Systems Dept. at Philadelphia, the Center utilizes a new type of vibration data analyzer, analog recording systems and an automatic analog switching system, as well as a new method of developing oscillograms - said to be 10 to 15 times faster than before. GE, engaged in research for the Air Force's strategic ballistic missile programs, feels the Center will simplify design and evaluation.

///GE/

322. SUNLIGHT MAY POWER SATELLITE INSTRUMENTS:

Lightweight solar batteries may provide the ideal means for flashing back important information from instruments in earth satellites. In test results of the U. S. Army Signal Engineering Laboratories, batteries depending upon solar energy functioned perfectly on a rocket soaring 190 miles up, approximating satellite conditions.

Glass-protected clusters of solar cells were attached to the skin of an AEROBEE-HI rocket launched by the Navy in the New Mexico desert. Army scientists checked results and found that the solar cells, composed of tiny silicon wafers, not only provided continuous electrical output but were unaffected by the high temperatures generated by the rocket as it passed through the atmosphere.

///Pentagon OPI press release 0620 free on request. DATA/

323. POWER STREAM MAY BE UNDER GULF STREAM - ONR:

Theory of Henry Stommel of Woods Hole Oceanographic Institute that a thermally driven current runs on westerly side of Atlantic basin from Arctic to Antarctic, if proven true, will change fundamental concepts concerning ocean currents, has interesting possibilities. The new theory has already been verified off Charleston by special instruments of the British Institute of Oceanography, reports the Office of Naval Research in their current Research Reviews.

Elevation of the massive deep flowing current appears to be only 18 inches from the bottom of the sea. ///Research Reviews 05-12/

324. SMALL BUSINESS AND ATOMIC ENERGY:

Nuclear electric generating capacity in this country could reach 227 million kilowatts by 1980, and result in sales of more than $27 billion in atomic energy equipment for industrial purposes, according to a new leaflet issued 17 June by the Small Business Administration.

The leaflet, Small Business and the Industrial Applications of Atomic Energy, says: "The opportunities for small business in connection with atomic power will probably involve the components, materials and services which are related to reactor construction and operation. The opportunities will develop on a long-term basis and may very well exceed the opportunities that grow out of any other aspect of atomic energy. ///Small Business Admin., Lafayette Bldg., Wash., D.C./

325. IN-FLIGHT PILOT REFUELING:

Naval aviators on long-range high-altitude flights had a problem: How to receive in-flight nourishment? With the new high-altitude jets to remove an oxygen mask at any time for any purpose is dangerous. To do so for the length of time necessary to eat or drink simply cannot be done. Descent to lower altitudes for this purpose is operationally unfeasible.

Yet breathing 100 percent oxygen for long periods of time has a dehydrating effect and the loss of crew efficiency from thirst and hunger is a serious consideration.

From personal knowledge through experience of those ill effects of long fasting, members of Navy Squadron VAH-2 took steps to develop an in-flight feeding system for use in their new Douglas A3D's.

What they came up with consists basically of standard Navy stainless steel two-quart thermos bottles and lengths of plastic surgical tube, the type used for intravenous feeding. Caps and corks of the thermos bottles are modified to permit insertion of the plastic tubes. The flyer inserts the other end of the tube under his mask, into his mouth, and proceeds to drink his lunch through the plastic straw.

///Naval Aviation News 06-8/

326. "LOX" PLANT:

A new generating plant capable of producing 150 tons of "LOX" (Liquid Oxygen) a day has been constructed for the Air Research and Development Command at Edwards AFB, Calif.

The $5.5 million plant offers a convenient source of liquid oxygen for testing rocket engines. ///ARDC 0613/

327. SELF-SERVICE LABORATORY STORE:

A self-service laboratory store stocking over 7000 items at the Naval Radiological Defense Laboratory, Hunters Point in San Francisco, pleases scientists. They "shop" for parts with shopping carts.

The entire facility is operated like any commercial supermarket with almost every item displayed in counter-height bins. Shoppers can pick up neatly packaged tubes of fresh sheep blood, 256-channel-pulse-height analyzers, Swiss mice or anything else the scientist needs to do his job at the Radiological Defense Lab. ///BuShips Journal 06-7/

328. TITANIUM REPORTS RELEASED TO INDUSTRY:

During the month of June the Department of Commerce announced as available the following titanium reports:

1. Corrosion and Ignition of Titanium Alloys in Fuming Nitric Acid. WADC, 67 pages, $1.75. Order No. PB 121940.
2. Department of Defense Sheet-Rolling Program: Status Report #1. Battelle Institute, 43 pages, $1.25. Order No. PB 121624.
3. Forming of Titanium and Titanium Alloys: Part 1. Battelle Institute, 247 pages, $6.25. Order No. PB 121917.
4. Chemical Surface Treatment of Titanium. Battelle Institute, 43 pages, $1.25. Order No. PB 111805.
5. Research and Development for the Welding of Titanium. A. O. Smith Corp., 79 pages, $2.00. Order No. PB 111849.

Order the above reports direct from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. ///Commerce/

329. SOLAR FURNACE CONVERTED FROM ARMY SEARCHLIGHT:

A solar furnace capable of producing temperatures up to 3500 degrees (C) is being used by the National Bureau of Standards to investigate temperature resistant materials. Refractory materials are needed to withstand extreme conditions found in atomic reactors, aircraft engines and guided missiles. The furnace was converted from a surplus Army searchlight with a five-foot diameter parabolic mirror. Use of the solar furnace eliminates disadvantages of high temperature tungsten arc or carbon resistor furnaces which tend to contaminate reaction and give misleading indications. ///National Bureau of Standards/

330. HIGH ALTITUDE SUIT PROVES SUCCESSFUL:

Just in time for fall, the well-dressed Navy pilot will be wearing a new-type full pressure high-altitude suit when flying his supersonic jet into the fringes of space. The new suit, developed by B. F. Goodrich Co., is designed as protection against loss of cabin pressure at very high altitudes where the thin atmosphere and high speed would combine to kill a man in seconds. The suit carries its own communication, oxygen and ventilation systems. ///Pentagon OPI 0610/

331. CBR GAS MASK developed by Army Chemical Corps with assistance of Mine Safety Appliances, is designed to protect soldiers against chemical, biological or radiological agents. Although the mask will not protect against direct radiation, it will prevent inhalation of particles prevalent in fall-out.

Some of the advantages of the new mask are better vision, a lower breathing resistance, better speech transmission and superior comfort.

Note that the new mask does not have the protruding canister that is used in current United States and foreign types. Elimination of the canister was made possible through the development by the Army Chemical Corps of a new lightweight, pliable gas-aerosol filter material.

///Pentagon OPI 0623/

332. MISSILE TEST RANGE TO BE EXTENDED:

The Air Force Missile Test Center, located at Patrick AFB, Fla. will be extending its facilities for range instrumentation to bases on the Fernando de Naronha and Ascension Islands in the near future.

///ARDC/

333. FIRST ACTUAL COMPLETE VANGUARD VEHICLE DELIVERED:

A prototype of the U. S. earth satellite launching vehicle has been delivered to the Navy's Project Vanguard unit at the Air Force Missile Test Center, Cape Canaveral, Fla.

In an announcement 20 June, the Navy stated that the Vanguard vehicle would receive a series of static trials prior to test firing over the center's vast ocean rocket range. Ground tests leading to an actual firing, the Navy says, usually take from six to eight weeks.

This will be the first of the actual Vanguard rockets to be test fired. Two previous satellite vehicle tests have used VIKING rockets to simulate the first of the launching vehicle's three stages. It also will be the first time the new General Electric 27,000-pound-thrust first-stage engine will be test flown. ///Pentagon OPI 0620/

334. RANGER COMMISSIONING SET FOR 10 AUGUST:

Navy's third FORRESTAL class carrier, the USS RANGER, will be commissioned at Norfolk 10 Aug. The $175 million ship will remain in the yard until early October for her fitting out period. She is then tentatively scheduled to go to the Caribbean for shake-down.

Capt. Charles T. Booth II will be skipper. Aircraft aboard will include F3H DEMONS, FJ3 FURYS, F9F-8 COUGARS, F7U CUTLASSES and A3D SKYWARRIORS. ///Navy Times 0608-44/

335. CATHODIC PROTECTION OF SHIP HULLS:

Current outputs of five different sizes of galvanic anode arrays used by the Navy for the cathodic protection of ship hulls are described in a report of research by the Navy.

The Current-Voltage Relationship of Galvanic Anode Arrays in Cathodic Protection, BuShips, 19 pages, 50 cents, Order No. PB 121821.

Order from Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D. C. ///Commerce/

336. NAVY LETS CONTRACTS FOR SMALL TOPEDO RETRIEVERS:

J. M. Martinac Shipbuilding Corp. of Tacoma and Elizabeth City Shipyard of Elizabeth City, N. C., have been awarded fixed price contracts totaling nearly $974,000 for the construction of five 72-foot torpedo retriever boats, the Navy announced 20 June. ///Pent. OPI/

337. CANADA BUILDS HYDROFOIL RESEARCH CRAFT:

The BRAS d'OR, a research craft fitted with hydrofoils and extensively instrumented, has been built under contract to the Canadian Government. The hull, which is of aluminum-alloy construction, is fitted with three hydrofoil units of similar size, each containing several "V"-shaped blades mounted between two side struts. The hydrofoil system employed is of the "surface-piercing" type. Upper blades are above the water as speed increases. The hull leaves the water at about 20 knots and at maximum speed has a clearance of some three feet, six inches. This relatively large hull clearance enables the craft to proceed in rough water at high speeds. ///Am. Mer. Marine Institute/

MAGAZINE PREVIEWS & REVIEWS

PREVIEWS

MISSILES & ROCKETS (Available 10 July 1957)

July issue has complete roundup on missile, rocket and satellite progress in the U.S. This is the first annual engineering progress issue. In this special edition M/R features a 42 page section on progress and specific data on all Army, Navy and Air Force missiles.

SIGNAL (Available 15 July 1957)

If you missed the recent meeting of the Armed Forces Communication and Electronic Association in Washington, don't feel too badly. Signal Magazine, official organ of the AFCEA, is devoting July issue to report of the convention. Speeches will be printed in entirety including those by James M. Bridges of the Electronic Office of the SecDef, the keynote luncheon address by R/Adm. Rawson Bennett, Chief of Naval Research and the banquet address by Donald C. Power, president of General Telephone.

AIR FORCE (Available 1 July 1957)

Official magazine of the Air Force Association features an article on the AN-8, new Russian assult transport aircraft, dubbed the flying whale by the Soviet pilots that fly the new plane. Air Force gives a full report on the aircraft including performance details and identification features. The Antonov designed cargo plane has a maximum gross weight of 88,000 pounds as compared with our Fairchild C-123B that grosses 60,000. The Russian plane is powered by twin 5100 eshp turboprops.

REVIEWS

U.S. NEWS AND WORLD REPORT (21 June 1957)

WASHINGTON WHISPERS says Army officials say privately they are not surprised at way AF missiles are running into trouble. Item "What's the Matter with Missiles?" says explosion of ATLAS last week was only the latest in series of misfires, runaways, crashes and other failures in recent missile tryouts; AF high-ranking missile officer says basic reason behind unreliable weapons rests primarily with performance of electronics.

AVIONICS: A program aimed at developing a practical method of preventing mid-air collisions is under study at Bendix Radio Division in Baltimore. The study, under sponsorship of Wright Air Development Center, will cover all possible and practicable techniques. Particular attention is being concentrated on using radar adaptations. Program will plan on aircraft traveling at speeds up to 1780 mph and altitudes up to 100,000 feet. ///ARDC/

ELECTRONICS: Army Quartermaster Corps has awarded a contract to Varian Associates of Palo Alto, Calif., for construction of a powerful traveling-wave electron accelerator for Army Ionizing Radiation Center at Sharpe General Depot, Stockton, Calif. The accelerator, most powerful unit of its kind, is capable of producing 18 kilowatts of radiation power at 24 million electron volts. It will be used to investigate the effects of ionizing radiation in the preservation of foods, leather, textiles and other materials.

It will be capable of sterilizing about 3000 pounds of 6-inch thick units of food per hour. A companion unit, a nuclear reactor producing gamma rays, will be designed by the Atomic Energy Commission. The Center is scheduled to begin operations late in 1958. ///Army Info/

LOGISTICS: Demonstrations aimed at finding a fast, safe, practical method of loading military vehicles aboard ship are being held at Ft. Eustis, Va. Vehicles ranging in size from the 1/4-ton jeep to huge tank retriever tractors and also including vans, semi-trailers and AA guns, were lifted aboard the Land Ship at the Fort. A joint project of the Army, Navy, Marine Corps and the Canadian Army, the demonstration results will provide guide lines for future loading methods. ///Ft. Eustis/

ROADS: SecDef Wilson has approved cooperation by the DOD in a two year long series of road tests designed to determine behavior of different types of road pavements under various traffic conditions. Tests will be conducted by the Highway Research Board of the National Academy of Sciences over six specially designed test tracks to be built near Ottawa, Ill. ///Pentagon OPI 0621/

TRAINING: Effective this month, the functions of the Mountain and Cold Weather Training Center at Camp Hale, Colo., will be transferred to Fort Greely, Alaska. Training there will be incorporated into existing courses at the Arctic Indoctrination School. Camp Hale will become general maneuver area. ///Army Info/

DATA ADS WORK

LIKE MAGIC

Do you have a service or product you would like top administrative officers in government and their counterparts in civilian industry to know about?

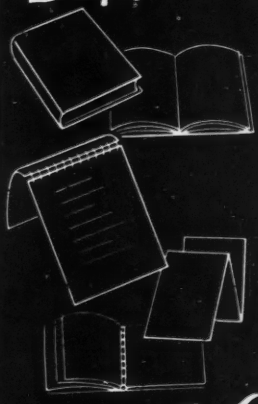
Beginning with the August issue, DATA will carry a very low-cost classified section.

Only 80 cents a line. Three line minimum ads just $2.40.

Complete rate cards for both our classified and display on request.

DATA PUBLICATIONS
Dupont Circle Building
1346 Connecticut Ave., NW
Washington 6, D. C.

Support... FOR INDUSTRY



GOVERNMENT STANDARD PARTS BOOKS
Four volumes of Government Standard Drawings including Utility, Aircraft and Military Standards, Design Data, and Engine, Propeller and miscellaneous items.

TRANSEALS®
Transparent, printed, self-adhering plastic sheets, for use by draftsmen and designers to eliminate drawing repetitive items such as Title Blocks, Diagrams, etc.

DESIGN MANUAL FOR REPAIR OF ALUMINUM STRUCTURES
208 pages covering every conceivable repair; profusely illustrated. Processes are fully described and materials, etc. are tabulated.

PRINTING ON VELLUM, SPECIAL TRACING AND REPRODUCTION PAPERS
Standard or special sizes printed by letterpress or offset lithography, either direct or reverse image.

PREPARATION AND PUBLICATION OF TECHNICAL DATA
To the specifications required by Government agencies: Technical Writing; Illustrating; Photography; Photo Retouching; Composition; Reproduction Typing; Reproducible Manuscript; Negatives; Printing and Binding.

PROPOSALS, SALES OR FACILITIES BROCHURES, VISUAL AIDS
A complete service including every phase of preparation and production. Reproduction in single or multi-color printing by letterpress or lithography. Lecture or Briefing Charts, Instructional Charts, Colored Slides, etc.

For information write:

Johnson RESEARCH CORPORATION
Subsidiary of Corydon M. Johnson Co., Inc.
250 Craftsmen to serve Industry's Technical and Graphic Arts needs
BETHPAGE, LONG ISLAND, NEW YORK
Phone: WEIls 8-4[illegible]

OFF PRESS NOW

missiles and rockets magazine

ENGINEERING PROGRESS ISSUE

Including an Exclusive 40-Page Guided Missile Encyclopedia

CONTENTS

Round-up article on men needed for missile engineering. Complete report on progress in Vanguard program with round-up of all Vanguard contractors.

plus reports on PROGRESS IN

. . . Army Missile Engineering . . . Army Ordnance Development . . . Air Force Space Medicine Research and Development . . . Air Force Scientific Research and Engineering . . . Naval Missile Development and Operations . . . Navy Research Engineering . . . U.S. Satellite Program.

CONTRIBUTORS TO ISSUE INCLUDE:

Dr. W. von Braun, Dir. Operations A.B.M.A.; L. L. Waite, V.P., North American Aviation Missile and Control/Equip. Operations; Maj. Gen. D. H. Tulley, Comdg. Gen., Ft. Belvoir, U.S. Army; Maj. Gen. A. Schomburg, Asst. Chief, Res. & Dev., Div. Bureau of Ordnance, U.S. Army; Brig. Gen. H. F. Gregory, Head, A.F. Office of Scientific Res.; Brig. Gen. O. O. Benson, Comdt. Aeromedical School, U.S.A.F., Randolph A.F.B.; Rear Adm. R. Bennett, Chief, Naval Research; Rear Adm. J. E. Clark, Dir., Guided Missiles, U.S.N.

WHAT IS MISSILES AND ROCKETS?

It's the first and only independent publication of its kind to serve management, engineering, production and other leaders in the missile/rocket industry. Each month presents latest developments pertaining to missiles airframe and power-plant design and manufacturing; propellants; guidance-control systems; ground handling-launching equipment; satellite science; missile business trends plus regular feature sections and columns.

SUBSCRIBE NOW: ENGINEERING PROGRESS ISSUE INCLUDED WITH ORDER

missiles and rockets
Magazine of World Astronautics
1001 Vermont Avenue, N.W.,
Washington 5, D. C.

☐ 2 years $12 ☐ 1 year $8
☐ Check enc. ☐ Bill me.

Name _____
(and job title)

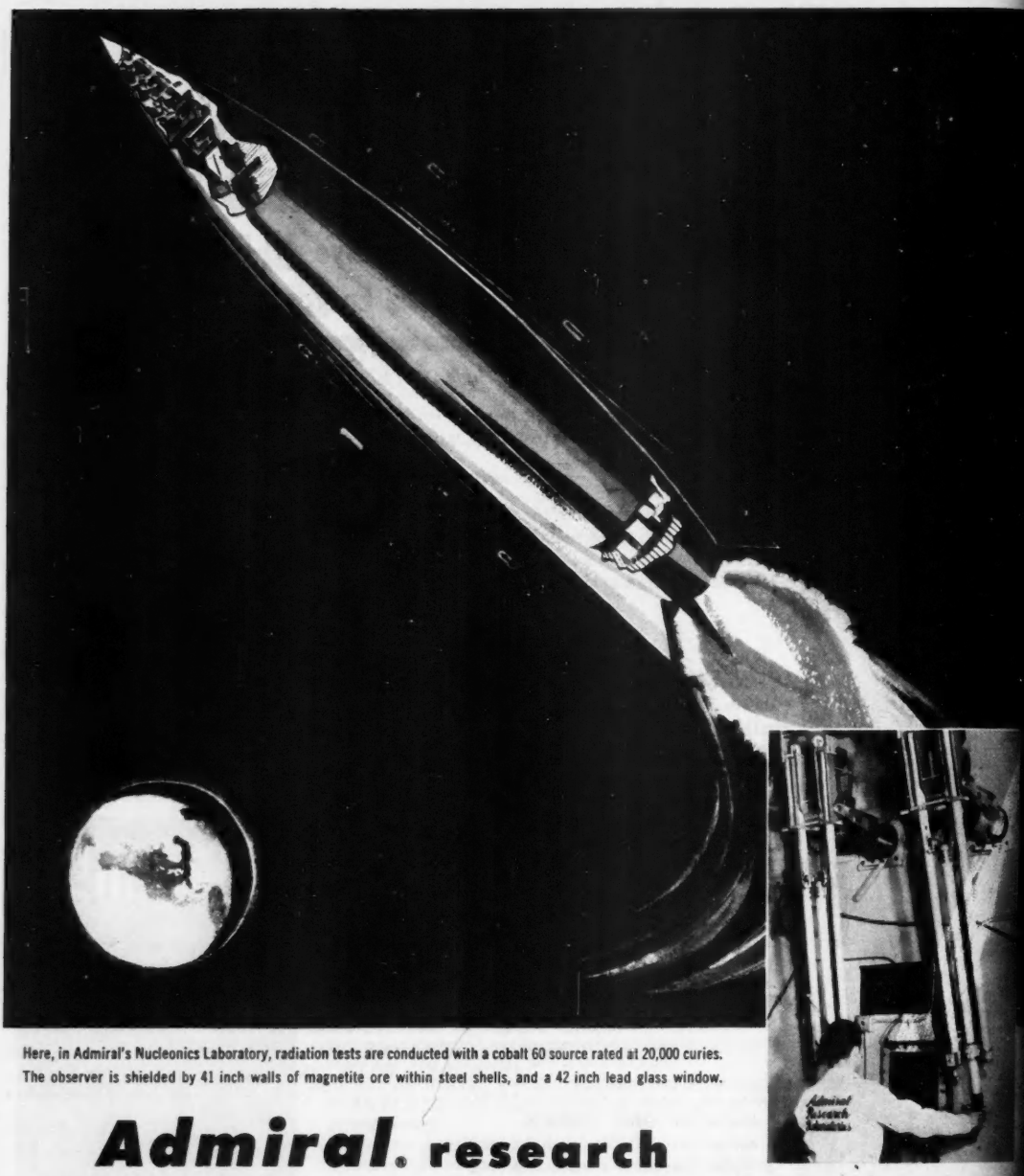
Company _____

Products/Services _____

Mail Address ☐ Home? ☐ Bus.? _____

_____

City, Zone, State _____



Here, in Admiral's Nucleonics Laboratory, radiation tests are conducted with a cobalt 60 source rated at 20,000 curies. The observer is shielded by 41 inch walls of magnetite ore within steel shells, and a 42 inch lead glass window.

Admiral. research

foretells the future of components traveling in outer space

What kind of power will drive man's first vehicle through outer space? It may be an ion propulsion device powered by a nuclear reactor. Ionic drive is now under investigation for the Air Research and Development Command. Investigators recognize the need to shield the human cargo against radiation if a nuclear power source is carried aboard. They also know that efficient design will not permit shielding the space ship's complex electronic equipment.

Then how will electronic components behave when exposed to nuclear radiation? The facts are being established by a continuing study now in progress at Admiral for the U.S. Air Force. This study provides advance knowledge to engineers charged with designing the space ship's electronic complement.

Admiral has equipped a special Nucleonics Laboratory which includes one of the world's largest cobalt 60 sources of gamma radiation. New instrumentation and techniques have been developed for measuring radiation environments. The project furthers Admiral's leadership in the field of fundamental and applied nuclear research. Detailed information is available to authorized persons.

LOOK TO *Admiral* FOR
RESEARCH • DEVELOPMENT • PRO
IN THE FIELDS OF: MILITARY TELEV
COMMUNICATIONS UHF AND VHF • R
RADAR BEACONS AND IFF • RADIAC
TELEMETERING • DISTANCE MEASU
MISSILE GUIDANCE • CODERS AND D
CONSTANT DELAY LINES • TEST E
ELECTRONIC COUNTER MEASURES

ENGINEERS: The wide scope of work in p
at Admiral creates challenging opp
in the field of your choice. Write D
Engineering and Research, Admiral
tion, Chicago 47, Illinois.

Admiral **CORPORATION • GOVERNMENT LABORATORIES DIVISION • CHICAG**

8